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**Assessment of environmental pollution applying
oxidative stress biomarkers in the mussel *Mytilus
galloprovincialis***

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In polluted environments, and especially in coastal waters, living organisms are most often exposed to complex mixtures of chemical contaminants. Mussels are desirable as bioindicators since they are likely to reflect changes in the environment pollution status. Transplanting mussels from a reference site to different locations allows biomonitoring the alterations due to environmental pollutants. The aim of the present study was to analyse the biochemical response of the mussels (*Mytilus galloprovincialis*) exposed to petrol refinery. Mussels purchased from a mussel farm in Messina (Italy) were transplanted for two months in a control clean site (Brucoli) and a polluted site (Priolo refinery). A third group was maintained in the same conditions in the farm for two months. Gills from each specimen (n=8 for each station) were dissected and used for biochemical analysis. Mussels from the three studied areas presented the same length and width. Mussels from the polluted site presented higher levels of malondialdehyde respect to the clean site. The activities of catalase and glutathione-S transferase (GST) were significantly higher in the polluted site, whereas the activity of acetylcholinesterase was significantly lower respect non-polluted sites. A significant increase in the gene expression of metallothionein (MT)-10, MT-20 and cytochrome P450 were reported in the polluted site respect to the other areas, whereas the increase in catalase and GST was not statistically significant. In conclusion, pollutants induce oxidative stress and increase the antioxidant and detoxifying system in mussels. The use of biomarkers in gills of the mussel *M. galloprovincialis* is a good tool to categorize differences between polluted and non-polluted areas.

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